

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002P17528WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE2003/003412	International filing date (day/month/year) 14 October 2003 (14.10.2003)	Priority date (day/month/year) 04 December 2002 (04.12.2002)
International Patent Classification (IPC) or national classification and IPC H02J 7/00		
Applicant SIEMENS AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 05 July 2004 (05.07.2004)	Date of completion of this report 26 November 2004 (26.11.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE2003/003412

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
 pages 1-14, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages 1-16, filed with the letter of 01 October 2004 (01.10.2004)
- ☒ the drawings:  
 pages 1/4-4/4, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/DE 03/03412

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-16	YES
	Claims		NO
Inventive step (IS)	Claims	1-16	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims		NO

### 2. Citations and explanations

The following document, D1, was cited by the applicant in the description. The same numbering will be used throughout the procedure:

D1: EP 0432639 (FRAUNHOFER GES FORSCHUNG)  
(19-06-1991)

#### Prior art

Document D1 is considered the prior art closest to the subject matter of claim 1.

D1 discloses an electrical circuit for a vehicle electrical distribution system, in particular for charge retention in a double layer capacitor (2), said circuit comprising:

- a first power supply unit;
- an electrical energy store (2) which is composed of a plurality of storage elements (2) and can be charged by the first power supply unit; and
- a charge balancing circuit comprising a primary

circuit and a plurality of secondary circuits for balancing the charge between the individual storage elements of the energy store,

- the primary circuit of the charge balancing circuit comprising a primary winding (27),
- whilst the secondary circuits of the charge balancing circuit each comprise a secondary winding (31) and are each connected parallel to the individual storage elements.

The subject matter of claim 1 is thus novel (PCT Article 33(2)).

#### Problem of interest

The present invention can therefore be considered to address the problem of:

- allowing recharging of the multi-element energy store from D1 when the vehicle is at rest.

#### Solution

The above problem is solved as per the invention by the following features:

- A) the charge balancing circuit is connected to the first power supply unit by a first switching element and to the energy store by a second switching element; and
- B) as a function of the switching condition of the switching elements, charge balancing is

carried out and/or the energy store is charged.

Inventive step

There is nothing in D1 to indicate how to switch the known charge balancing circuit in order to solve the above-mentioned problem.

The calculation of the total reactive power is neither anticipated nor suggested by the cited document D1.

More particularly, D1 does not disclose a second power supply unit, or switching elements that are connected to the first power supply unit and/or to the energy store. In D1 the charge balancing circuit cannot be switched and is always connected to the positive terminal of the multi-element energy store.

It would not have been obvious to a person skilled in the art to use all three elements (second power supply unit, first and second switching elements) in the circuit as per D1 (feature A) or to carry out charge balancing and/or charging of the energy store as a function of the switching condition of the switching elements.

Consequently, a person skilled in the art would not arrive at the subject matter of claim 1 without thereby being inventive.

The circuit as per claim 1 and the corresponding operating method as per claim 10 are therefore inventive (PCT Article 33(3)).

Industrial applicability

The electrical circuit as per claim 1 can be used as a voltage transformer in a vehicle electrical distribution system and therefore claim 1 and the corresponding operating method also meet the PCT requirements in respect of industrial applicability (PCT Article 33(4)).

Dependent claims

Claims 2 to 9 and 11 to 16 are dependent on claims 1 and 10, respectively, and therefore likewise meet the PCT requirements for novelty, inventive step and industrial applicability (PCT Article 33(2), (3) and (4)).